ISOLATION PRACTICES

An essential component of an infection control program is the formal adoption of a standard isolation system for patient care; this system should be included in the written policies and procedures for the facility. An isolation system such as Standard Precautions (SP) or Body Substance Isolation (BSI) and Universal Precautions (UP) is appropriate. Additional isolation practices may be required depending on a patient's symptoms and the suspected or confirmed diagnosis (e.g., active tuberculosis). These additional precautions should be included in the facility infection control policy with a description of when these precautions should be used for a patient.

The Utah Department of Health does not specify which type of isolation system must be used but encourages the use of Standard Precautions (a combination of BSI and Universal Precautions) with additional transmission based precautions when indicated. As long as the facility has based its policy on current infection control recommendations, technology and practices and a written policy is available for the facility, it should meet the licensing standards. However, regardless of the policy used, all employees must be knowledgeable of the standard infection control policy and practice it consistently. The infection control practitioner, through surveillance of communicable disease problems in the facility, should periodically evaluate the facility standard to ensure that it is adequate to address the needs of the residents by preventing nosocomial infections and disease outbreaks.

Signs are not necessary for standard isolation practices used consistently with each patient. For instance, if standard precautions are adopted a sign is not needed near each patient room to remind staff of when to use the proper protective equipment. However, the staff must be knowledgeable of and able to appropriately implement the system for patient care or for cleaning and handling contaminated linens, equipment or surfaces. If an additional transmission based precaution is necessary to care for a patient, signs should be posted to remind personnel of the appropriate precautions and to ensure that visitors and others do not enter the room without the proper screening and/or protective equipment. Appropriate signs would include a sign specific for the required precaution and an additional sign stating

The CDC and the Hospital Practices Advisory Committee (HICPAC) published the "Guidelines for Isolation Precautions in Hospitals" in January 1996. The CDC currently recommends a combination of BSP and Universal Precautions called Standard Precautions with transmission based precautions used for patients with suspected or confirmed diseases of certain etiologic agents. The guidelines may not be practical or difficult to implement in the long-term care setting. Thus, isolation practices that will prevent transmission of infection should be developed and used in accordance with the epidemiology of the suspected or confirmed disease. It is important to note that when a patient is transferred, the receiving facility should be notified (in advance of transfer) of the patient's condition so that isolation precautions will be immediately placed into effect.

"Visitors stop! See the nurse before entering" so visitors could be appropriately educated. Infection control considerations are slightly different (depending upon the type of infection) for visitors since they do not provide the same type of care for patients (i.e., dressing changes, perineal care, etc.) and they usually have contact with only one patient.

Because many infectious organisms are carried without signs or symptoms of infection, and medical history/examination cannot always identify persons infected or colonized, it is practical to treat all moist body substances, secretions, excretions and non-intact skin as potentially infectious. Standard Precautions, as well as Body Substance Isolation, are based on this philosophy and have been proven effective in many types of medical settings including long-term care facilities. The premise is that any blood or body substance (including feces, urine, pus, respiratory secretions, etc.) may contain infectious organisms and requires health-care workers to use personal protective equipment any time contact (including broken or abraded skin) may be anticipated. Using these precautions are preferred because: 1) they afford protection against communicable diseases that are not transmitted by blood; 2) the type of protective equipment used is not dependent on the patient's diagnosis; and 3) this system tends to be easier for health-care workers to implement because it applies consistently to <u>all</u> patients <u>all</u> the time.

When used correctly, Standard Precautions reduce but do not eliminate additional isolation practices that in certain instances must be observed. Additional transmission based isolation practices are necessary to avoid the spread of certain communicable diseases or conditions. Transmission based precautions are designed for use with patients documented or suspected to be infected with highly transmissible or epidemiologically important pathogens for which additionally precautions (beyond SP) are needed to interrupt the transmission of disease. An explanation of other precautions that complement Standard Precautions is located in the following chart.

Good written infection control standards are imperative and should be readily accessible for reference by staff in the facility. Policies or plans should be written outlining procedures to follow if a patient develops or is suspected to have certain communicable diseases. The policy should include methods for minimizing exposure to health-care personnel, visitors and other patients, and procedures for the implementation of the isolation precaution.

Compliance with infection control policies and Occupational Safety and Health Administration (OSHA) standards require the use of engineering controls (such as negative pressure rooms for patients with active tuberculosis disease), training of personnel and provision of personal protective equipment for employees. Additionally, the use respiratory protection (HEPA respirators or respiratory protection meeting the N95 criteria) must be used by staff caring for patients with active tuberculosis disease.

There is not a requirement for size and color of the signs used for isolation. However, if there is a sign needed, it should be posted where it is easily seen. Depending upon the nationality of employees, residents and visitors, signs should be written in English and another language if appropriate. The diagnosis of the patient should never be written on the sign in order to protect

patient confidentiality. Signs should include the type of precautions and protective equipment necessary to protect those who provide patient care, and should request visitors to contact the nurse before entering the room.

Recommendations for isolation practices in long-term care facilities are found on the following chart and should be used to provide guidance when developing a policy. Depending on the level of skill and the types of equipment available, it may be appropriate to include the procedures for transferring a patient suspected of having a communicable disease that requires a type of isolation not available at the facility. This is the case, for example, when a patient is suspected to have active tuberculosis disease and the long-term care facility does not have a negative pressure room.

These are guidelines based on current infection control research adapted for use in the long-term care setting. While they are written with an understanding of both the Bloodborne Pathogen and the draft Tuberculosis Standard which are currently enforced by OSHA, a full explanation of the criteria required for compliance to these standards has not been given. The recommendations provided are based on standard infection control practices to prevent the transmission of communicable diseases in the long-term care setting.

Resources:

1. State of Missouri Department of Health. *Infection Control in Long-Term Care Facilities with an Emphasis on Body Substance Precautions 1992:*13-27.

2. The Centers for Disease Control and Prevention. *Guideline for Handwashing and Environmental Control, 1985.*

3. The Centers for Disease Control and Prevention. *Guidelines for Prevention of HIV Transmission in Health-Settings,* MMWR 1987;26:1-18S.

4. The Centers for Disease Control and Prevention. *Guidelines for Prevention of Transmission of Human Immunodeficiency Virus and Hepatitis B Virus to Health-Care and Public Safety Workers,* MMWR 1989;38.

6. McPherson D and Jackson M. Isolation precautions for a changing environment...a new approach. *J of Healthcare Material Managemen*t 1987;5:28-32.

7. Jackson M and Lynch P. Isolation practices: a historical perspective. *American Journal of Infection Control* 1985;13:21-31.

8. The Centers for Disease Control and Prevention and the Hospital Practices Advisory Committee. *Guideline for Isolation Precautions in Hospitals,* Infection Control and Hospital Epidemiology 1996;17:53-80.

9. The Centers for Disease Control and Prevention. *Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health-Care Facilities,* 1994. **Federal Register**, 1994;59:52242-54303.

10. Occupational Safety and Health Administration. *Occupational Exposure to Bloodborne Pathogens; Final Rule*. **Federal Register**, 1991;56:64175-64182.

11. The Centers for Disease Control and Prevention. *Recommendations for preventing transmission of the Human Immunodeficiency Virus and Hepatitis B Virus to patients during exposure prone invasive procedures.* MMWR, 1991;40, RR-8.

Isolation Precautions Commonly Used in Long-Term Care Facilities to Prevent the Spread of Communicable Diseases

Precaution	Steps to Follow:	Used for the following or suspect diagnosis:
Standard Precautions *(Combination of Universal Precautions and Body Substance Isolation)*	● Assign rooms according to the guidelines indicated below. ● Gloves should be worn when handling blood, any body fluid, secretions, excretions *(except sweat)* or touching any moist body substance, mucous membranes, non-intact skin including slight rashes. ● Face shields, goggles, masks and gowns should be worn if procedure will generate aerosols or splashing of body fluids. ● Wash hands with soap and warm water lathering for 10-15 seconds after removing protective equipment. Use plain (not anti-microbial) soap.	● Used consistently with each patient at all times regardless of diagnosis. ● While not required, posting educational posters/information helps to remind staff of the importance of handwashing and the proper use of protective equipment. ● Communicable diseases can spread rapidly throughout a facility including: MRSA; pediculosis (lice); scabies; the etiological agent of any draining skin, wound or burn infection (including decubitus ulcers); and gastroenteritis. ● It may be necessary to remove gloves, wash hands between tasks and procedures on the same patient to prevent cross-contamination of different body sites.
Contact Precautions	● Use Standard Precautions. Private room or cohort if possible. Wear gloves when entering the room. Wear gown if your clothing may have contact with the patient or environmental surfaces in the room or if the patient is incontinent, has diarrhea or has wound drainage not contained by a dressing. Remove gloves and PPE in room and wash hands. then do not touch anything which could contaminate them. Dedicate non-critical patient care equipment.	● Consider for use with patients infected with cellutis with uncontrolled drainage, major infected decubitus ulcers or wounds, diapered or incontinent patients infected with gastroenteritis (such as those caused by *C. difficile*, *E. coli* 0157:H7, *Shigella* species, *Salmonella*, etc.) disseminated herpes zoster, those with multi-drug resistant organisms (including MRSA and VRE), and scabies.
AFB Isolation (Note: AFB isolation is a type of airborne precaution which requires additional personal protective equipment.)	● HEPA (high efficiency particulate air) filter* personal protective mask or a respirator that meets NIOSH's N95* category checked with a fit test before each use; can only be used by persons who have passed a medical evaluation and a fit testing process. ● Private room with negative pressure (a minimum of 6 air exchanges/hour) and a non-recirculated air supply. The door must remain closed in order for the negative pressure to work properly. The negative pressure should be checked each time the system is used. If a facility does not have the proper protective equipment, the patient should be transferred with permission to a facility that has the necessary negative pressure room(s) and staff trained to care for TB patients.	● Pulmonary tuberculosis, (suspected or confirmed). ● Note that the patient should wear a mask without an exhalation valve which covers the nose and mouth any time when outside the room. Prompt use of anti-tuberculosis therapy is an effective means of control; precautions should exist until 3 negative AFB sputum smears are obtained (generally 2-3 weeks after appropriate therapy). ● Note that facilities without the proper negative pressure room must transfer confirmed or suspected cases to a facility that has them.
Airborne Precautions *(for diseases transmitted by airborne droplet nuclei or small particles < 5 µm)*	● Private room with negative pressure (a minimum of 6 air exchanges/hour) and a non-recirculated air supply or monitored HEPA filtered prior to recirculation. Susceptible personnel (those who have not had the disease or been immunized) should not care for the patient.	● Measles and varicella.

Precaution	Steps to Follow:	Used for the following or suspect diagnosis:
Droplet Precautions	● Private room. ● Masks are indicated when coming within three feet of the patient until adequately treated (varies depending upon cause).	● Herpes zoster (localized or disseminated in an immunocompromised patient), pneumonia or draining lung abscess, meningitis (bacterial or etiology unknown).

Private Rooms - Private rooms should be used for any resident with uncontrollable secretions, excessive coughing, uncontrollable excretions, widespread skin disease, heavy wound drainage or who soils the room environment with body substances. Any resident presenting with the above symptoms should be confined to his/her room until the condition(s) resolve. Private rooms should be considered for patients infected with a multiply-resistant organism. If no private rooms are available, the resident should be placed with a low-risk resident determined by the infection control practitioner and/or physician. In an outbreak situation, cohorting of cases may be an acceptable alternative.

Reporting - All outbreaks as well as those communicable diseases classified as reportable by law must be reported to the local health district or the Bureau of Epidemiology at (801) 538-6191.

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*The Occupational Safety and Health Administration currently requires this type of respiratory protection.

STANDARD PRECAUTIONS FACT SHEET

What are Standard Precautions?

Standard Precautions refer to the consistent use of barrier methods to prevent direct contact with blood, body fluids, secretions and excretions of another person. Gloves are worn to prevent contact with non-intact skin, moist mucous membranes, and body fluids; masks and eye protection are worn when there is a chance of splashing body fluids into the eyes, nose or mouth; gowns are worn if there is a chance that clothing may become soiled with body fluids. Standard Precautions also include proper disposal of contaminated equipment and good handwashing practices.

Why should I use Standard Precautions?

Blood and body fluids often contain microorganisms that can cause illness. In order for an illness or communicable disease to occur, the microorganism must be transmitted from the reservoir (blood or body substances) to a susceptible host. The use of barrier methods such as gloves, as well as good handwashing practices, helps to prevent the transmission of a pathogen into a susceptible host and minimizes the chance that disease or infection will occur.

All blood and body fluids, secretions, excretions except sweat can contain microorganisms capable of causing disease or infection if introduced into a susceptible host. By using Standard Precautions, you protect yourself and your patient from exposure that might cause illness.

How do Standard Precautions Work?

Standard Precautions require that appropriate barrier methods be used to avoid contact with body fluids, secretions, excretions and broken skin. The "barriers" such as gloves, gowns, goggles and masks must be put on before beginning the task where exposure could occur. For example, if someone vomits and the area must be cleaned and disinfected, begin the task by putting on latex or vinyl gloves. After finishing, remove the gloves and place in the proper trash receptacle. Finally, wash your hands with warm water and soap.

What is the difference between Universal Precautions and Standard Precautions?

Universal Precautions were developed by the Centers for Disease Control and Prevention to prevent bloodborne diseases such as infection with the human immunodeficiency and hepatitis B viruses. Standard Precautions require that barrier methods be used for all body fluids and substances not just those which contain bloodborne pathogens. This is because many diseases are not "bloodborne" and can be caused from exposure to other body secretions and excretions. Standard Precautions are based upon the idea that all body secretions and excretions could contain microorganisms capable of causing disease.

What is an example of Standard Precautions?

The hepatitis A virus is transmitted by ingesting minuscule amounts of feces from an infected person, generally through contaminated hands or foods (fecal-oral route). Using protective equipment such as gloves to change diapers prevents contact with feces. After removing the gloves, good handwashing practices reduce the chance that the hepatitis A virus is on your hands. Standard Precautions (in this case, gloves and handwashing) help to eliminate the mode of transmission necessary to cause infection with the hepatitis A virus.

What body fluids are included in Standard Precautions?

All fluids, secretions, excretions and non-intact skin of the body. This includes blood, saliva, sputum, feces, urine, open lesions, non-intact skin (including broken skin, rashes, skin irritation), secretions from wounds, vomitus, breast milk and all other fluids, secretions and excretions *except sweat*.

Do Standard Precautions just mean using protective equipment such as gloves?

No, Standard Precautions don't stop with protective equipment. They also include proper disposal of contaminated equipment and good handwashing practices. They include disposing of sharps in a rigid container, putting dirty linen in the proper receptacle and putting infectious waste in a biohazard container. Standard Precautions also mean that disposable resuscitation devices should be used to perform cardio-pulmonary resuscitation (CPR).

What should I do if I get blood or body fluids on my skin?

Wash the area immediately with soap and warm water. Flush the area with lots of water. Inspect your skin to determine if it is intact. Intact skin is an effective barrier to infectious organisms. If the exposure warrants and you were exposed in an occupational setting, follow your employer's exposure control plan and seek the appropriate medical attention. If the exposure was percutaneous such as a needlestick or involved non-intact skin, make sure that you seek medical attention as soon as possible. Remember that it is important to follow up on all non-intact skin, percutaneous and mucous membrane exposures to blood and body fluids.

Where can I get more information?

From your nursing director.
From your doctor.
From your local health department.
From the Utah Department of Health, Bureau of Epidemiology at (801) 538-6191.

Tuberculosis

Tuberculosis (TB) is of special concern in the health-care setting because airborne transmission may occur to others before the diagnosis of TB is even considered. Persons aged 65 years and over have a higher incidence of TB infection than the general population. The incidence of TB infection in the elderly living in long-term care facilities has been estimated to be between two and seven times higher than among similar persons living in the community. Thus, an effective tuberculosis prevention and control program in the long-term care facility is essential and should include components for early identification, isolation and treatment of persons with active tuberculosis.

Epidemiology, Transmission and Pathogenesis:

M. tuberculosis is carried in airborne particles known as droplet nuclei that can be generated when persons with pulmonary or laryngeal tuberculosis cough, speak, sneeze or sing. The particles are very small, from 1 - 5 microns, which allows them to be suspended in the air, travelling by normal air currents throughout the room or building. Infection occurs when a person inhales the particle and the droplet nuclei become established in the alveoli of the lungs and spread throughout the body by the lymph and blood systems. Generally, the bacilli multiply in the body from two to ten weeks after exposure. Then, in most persons, the immune response limits further multiplication and spread of the bacilli. This is considered TB *infection*.

In a very small percentage of persons (<1%), this initial infection rapidly progresses to clinical illness or TB *disease*. Between five and ten percent of all persons infected with TB and not treated will develop signs and symptoms after an interval of months, years or decades, when the bacteria begin to multiply again and produce TB disease. The risk of developing the disease is greatest the first year after infection and is markedly increased for immunosuppressed persons including those infected with the human immunodeficiency virus (HIV). The risk of developing TB disease also is increased during the elderly years as the immune system wanes and can no longer keep the encapsulated bacteria from reproducing.

The pulmonary system is most often affected by TB, but the disease may manifest itself in other areas of the body. The disease is transmitted primarily by patients who have pulmonary disease with a productive cough, pulmonary cavitation in the chest x-ray and a positive result for acid-fast bacilli (AFB) in a sputum smear. Non-pulmonary disease located in the respiratory tract or oral cavity, or extrapulmonary disease that manifests as an open abscess or draining lesion may also be communicable if aerosol producing procedures are being performed. Appropriate anti-tuberculosis chemotherapy can reduce infectiousness, but the duration of therapy to reach this point depends on the extent of disease in the individual. Lack of infectivity may be established by at least three AFB negative sputum smears taken on three consecutive days for a patient on (and continuing) chemotherapy.

Risk Factors:

Those at risk for tuberculosis infection include persons with HIV infection; close contacts of active tuberculosis cases; those immunocompromised by medical conditions; foreign-born persons from high prevalence countries (Asia, Africa and Latin America); medically underserved populations including homeless persons and high-risk racial minorities (African Americans, Hispanics and Native Americans); alcoholics and intravenous drug users; the elderly and residents of long-term care facilities including nursing homes and prisons.

Tuberculosis Screening:

The Centers for Disease Control and Prevention (CDC) recommends residents and staff of long-term care facilities be two-step tested using Purified Protein Derivative (PPD) for tuberculosis by the Mantoux method to establish a reliable baseline. After a reliable baseline is established, annual testing with one Mantoux test (not two-step) is recommended. Residents should be tested upon admission and staff upon hiring in the facility. Multiple puncture tests (tine tests) should not be used.

The Mantoux test consists of an intradermal injection of 0.1 ml of PPD containing 5 tuberculin units (TU) into either the volar or dorsal surface of the forearm. When using the two-step method, if the reaction to the first test is negative, a second Mantoux test should be given one to three weeks later. If the second test result remains below the point for a positive test, the reaction is considered negative. However, if the reaction is positive, it probably represents a boosted reaction of an old infection and not a new infection. Persons reading the results of a PPD test should be trained to carefully measure the induration (defined as palpable swelling) 48 to 72 hours after the test was placed. The reading consists of observing the presence or absence of induration by inspection and palpation of the arm. If induration is present, it should be carefully measured transversely and recorded in millimeters. If no induration is present, the measurement should be recorded as 0 mm. Care should be taken not to include areas of erythema (redness) with this measurement. Measure only the induration.

Why Use the Two-Step Method?

The two-step method is used because the first test of an infected person may sometimes show little or no reaction, while the second test is positive. In this instance, the first test stimulated the immune system so that the immune response to the second test is positive. This is called the boosting effect and indicates the person being tested has been previously sensitized to mycobacterial antigens. It is important to remember that repeated testing of uninfected persons does not sensitize them to tuberculin.

Persons who may test positive include those infected with TB or a non-pathogenic mycobacterium, or recipients of the Bacillus of Calmette and Guerin (BCG) vaccination, although not all vaccine recipients will have a positive reaction. Any person with a positive skin test should receive the appropriate medical evaluation and follow-up in order to be screened for signs and symptoms of disease and to determine if anti-tuberculosis therapy is indicated.

Testing is indicated for all residents and staff except those persons with a documented history of a positive PPD test.* An individual who has received the BCG vaccine should receive the

Mantoux test unless he/she has a documented history of a positive PPD reaction. Retesting may still be indicated if the positive test was within ten years of the BCG immunization and more than ten years have passed since the person received the vaccination. Although there is not a reliable method to distinguish whether the positive test is caused by actual TB infection or from the BCG vaccination, it is important to provide the appropriate medical evaluation and follow-up. Persons who received the BCG vaccine should have their vaccination history documented in the record. BCG recipients who have a positive reaction to tuberculosis testing should be considered positive due to TB infection since the BCG vaccine is given in areas where there is a high endemic rate of tuberculosis. Any positive result is considered an indicator for possible infection with *M. tuberculosis* and any person testing positive needs to be screened and/or evaluated for active disease.

It is important for ICPs to note that some persons may be anergic, meaning that they have impaired or absent ability to react to common antigens administered through skin tests. Anergy is detected by administering at least two other delayed-type hypersensitivity antigens (tetanus toxoid, mumps or *Candida*) by the Mantoux method. Persons who have ≥ 3 mm reaction to any of the skin tests including the tuberculin test are not considered anergic.

Reporting Positive Results:

All persons with positive PPD results need medical evaluation and follow-up. At a minimum, a chest x-ray is required. The local health department or private physician is able to provide appropriate screening and follow--up. Follow-up for a positive PPD test may include a chest x-ray, sputum collection, and/or treatment.

Active tuberculosis is reportable by law. Any person diagnosed with active tuberculosis must be reported to the local health department or the Utah Department of Health. All residents with a history of a positive PPD test should be evaluated at least annually for signs and symptoms of tuberculosis disease and the results documented. However, it is not necessary to conduct annual chest x-rays on PPD positive persons.

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*Note: The measles vaccination may temporarily suppress tuberculin reactivity. MMR vaccine may be given on the same day as TB testing. If the MMR has been given recently, postpone the TB test until 4 - 6 weeks after the administration of the MMR. Pregnancy is not a contraindication to the Mantoux test. Pregnant women may be screened safely using the Mantoux test.

Retesting Employees:

Skin-test negative employees and volunteers should be tested annually and after any exposure to a person who has infectious tuberculosis disease (sputum smear positive). A skin-test conversion is defined as an increase of ≥ 10 mm for a person < 35 years of age or an increase of ≥ 15 mm for a person ≥ 35 years of age within a two year period. Health-care workers who perform high risk procedures such as bronchoscopy or who are frequently exposed to patients with active tuberculosis (> 6 patients a year) should be retested at least every six months or more frequently as required by the Occupational Safety and Health Administration (OSHA). A TB risk assessment, which includes calculating an annual conversion rate among employees, should be used for assessment of infection control activities and to ensure that nosocomial infections are not occurring.

All skin-test convertors should receive medical follow-up including a chest x-ray and if indicated, preventive treatment and be referred to the local health department. If the source of infection is not known and/or additional conversions occur, screening and periodic retesting of employees and residents should be done in an effort to locate the source. If the ICP is unsure how to do this, the local and/or state health department are able to provide assistance.

Assessment:

The following information should be collected and reviewed in order to evaluate the effectiveness of tuberculosis control efforts: 1) the percentage of staff and residents with positive tests; 2) the percentage of staff and residents showing conversion; 3) the percentage of persons converting who were recommended for anti-tuberculosis therapy and completed the course; 4) a description of the type of therapy and supervision of therapy; 5) the number of persons who experienced drug toxicity or intolerance to anti-tuberculosis medications; and 6) the number of persons who discontinued therapy and their reasons for doing so. The assessment should also include the number of persons with active TB disease, the number of days until recognition and isolation (or transfer), the number of persons exposed and results of follow-up.

Infection Control:

Any resident or staff member who has symptoms compatible with tuberculosis (new cough or change in character of sputum in someone with a chronic cough; and anorexia, weight loss, night sweats and/or fever for > 3 weeks) regardless of the skin test result, should be evaluated by a medical professional within 72 hours. This evaluation generally includes a chest x-ray and bacteriologic examination of sputum for AFB. It is important to note that while the Mantoux test is the best screening method available (between 90 - 95% sensitive in well-nourished immunocompetent persons), false negatives may occur due to the immunologic response in the person being tested, difficulties in administering the test or in interpreting the results. Never rule out the possibility of tuberculosis on the basis of a negative or non-reactive skin test.

Health-care workers or staff members with signs and symptoms should be removed from duty until the diagnosis of TB is excluded or until they become non-infectious as a result of the appropriate chemotherapy. Non-infectious means the patient has: 1) received adequate therapy for 2-3 weeks, 2) had a favorable clinical response to therapy, and 3) had three negative sputum smear results from sputum collected on three different days.

If a resident is suspected of having active tuberculosis, he/she should be placed in AFB isolation in the facility or transferred to a facility that has the appropriate negative pressure room and trained staff to implement these precautions. The resident should be taught to cover his/her mouth when sneezing or coughing and to wear a mask if he/she must leave the negative pressure room. As required by OSHA, only trained health care workers who have been fit tested and are able to use the appropriate respiratory protection should provide care to the patient. OSHA requires the use of a personal respiratory protective device which has NIOSH approval (N95 or HEPA) for employees entering the negative pressure room or sharing air space with a suspected or confirmed infectious tuberculosis patient.

Follow-up of contacts of persons with newly diagnosed tuberculosis is necessary because they are at risk for developing infection and/or disease. Contacts include visitors, roommates and staff who have spent time with or who have cared for the person with active tuberculosis or source patient. The likelihood of transmission depends on a number of factors. They include the infectiousness of the source patient, the type of environment where exposure occurred and the characteristics of the contact itself, such as duration of exposure.

Consultation regarding follow-up to exposures or training for the administration and reading of the Mantoux test is available from the Utah Department of Health, Tuberculosis Program at (801) 538-6141 or your local health department.

Resources:

1. The Centers for Disease Control and Prevention. *Prevention and Control of Tuberculosis in Facilities Providing Long-Term Care to the Elderly, Recommendations of the Advisory Committee for Elimination of Tuberculosis,* MMWR 1990;39:7-20.

2. The Centers for Disease Control and Prevention. *Guidelines for Preventing Transmission of Tuberculosis in Health-Care Settings, with Special Focus on HIV-Related Issues,* MMWR R-17.

3. Pugliese, G. *Screening for Tuberculosis Infection: An Update.* Am J of Infect Control, 1992,20:37-40.

4. Finucaine, T. *The American Geriatrics Society Statement on Two-step PPD Testing for Nursing Home Patients on Admission.* J of the Am Geriatric Society 1988,36:77-78.

5. American Thoracic Society. *Treatment of Tuberculosis and Tuberculosis Infection in Adults and Children.* The Am Review of Respiratory Disease 1986,134:355-363.

6. Gallium, M. and Magi, D. *Brief Report: Tuberculin Testing, BCG in Pregnancy.* Infect Control and Hospital Epidemiology 1988,9:119-121.

7. CDC. *Core Curriculum on Tuberculosis, What the Clinician Should Know,* Third Edition, 1994.

Characteristics of an Effective Tuberculosis (TB) Infection Control Program

Adapted from: The Centers for Disease Control and Prevention. Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-Care Facilities, ***The Morbidity and Mortality Weekly Report***, 1994;43,RR-13:20-21.

I. Assignment of Responsibility

- A. Assign responsibility for the TB infection-control program to a qualified person(s).
- B. Ensure that persons with expertise in infection control, occupational health, and engineering are identified and included.

II. Risk assessment, TB infection-control plan, and periodic reassessment

- A. Initial risk assessments
  1. Obtain information concerning TB rates in the community.
  2. Evaluate data concerning TB patients in the facility.
  3. Evaluate data concerning purified protein derivative (PPD)-tuberculin skin-test conversions among health-care workers (HCWs) in the facility.
  4. Rule out evidence of person-to-person transmission.

- B. Written TB infection-control program
  1. Select initial risk protocol(s).
  2. Develop written TB infection-control protocols.

- C. Repeat risk assessment at appropriate intervals.
  1. Review current community and facility surveillance data and PPD-tuberculin skin-test results.
  2. Review records of TB patients
  3. Observe HCW infection-control practices.
  4. Evaluate maintenance of engineering controls.

III. Identification, evaluation, and treatment of patients who have TB

- A. Screen patients for signs and symptoms of active TB:
  1. On initial encounter in emergency department or ambulatory-care setting.
  2. Before or at the time of admission.

- B. Perform radiologic and bacteriologic evaluation of patients who have signs and symptoms suggestive of TB.

- C. Promptly initiate treatment.

IV. Managing outpatients who have possible infectious TB

A. Promptly initiate TB precautions.

B. Place patients in separate waiting areas or TB isolation rooms.

C. Give patients a surgical mask, a box of tissues, and instructions regarding the use of these items.

V. Managing inpatients who have possible infectious TB

A. Promptly isolate (and/or transfer) patients in a negative pressure room who have suspected or known infectious TB.

B. Monitor the response to treatment.

C. Follow appropriate criteria for discontinuing isolation.

VI. Engineering recommendations

A. Design local exhaust and general ventilation in collaboration with persons who have expertise in ventilation engineering.

B. Use a single-pass air system or air recirculation after high-efficiency particulate air (HEPA) filtration in areas where infectious TB patients receive care.

C. Use additional measure, if needed, in areas where TB patients may receive care.

D. Design TB negative pressure isolation rooms in health-care facilities to achieve ≥ 6 air changes per hour (ACH) for existing facilities and ≥ 12 ACH for new or renovated facilities.

E. Regularly monitor and maintain engineering controls.

F. TB isolation rooms that are being used should be monitored daily to ensure they maintain negative pressure relative to the hallway and all surrounding areas.

G. Exhaust TB isolation room air to outside (away from doors or windows) or, if absolutely unavoidable, recirculate after HEPA filtration.

VII. Respiratory protection

A. Respiratory protective devices should meet recommended performance criteria.

B. Respiratory protection should be used by persons entering rooms in which patients with known or suspected infectious TB are being isolated, by HCWs when performing cough-inducing or aerosol-generating procedures on such patients, and by persons in other settings where administrative and engineering controls are not likely to protect them from inhaling infectious airborne droplet nuclei.

C. A respiratory protection program is required at all facilities in which respiratory protection is used.

VIII. Cough-inducing procedures

A. Do not perform such procedures on TB patients unless absolutely necessary.

B. Perform such procedures in areas that have local exhaust ventilation devices (e.g., booths or special enclosures) or, if this is not feasible, in a room that meets the ventilation requirements for TB isolation.

C. After completion of procedures, TB patients should remain in the booth or special enclosure until their coughing subsides.

IX. HCW TB training and education

A. All HCWs should receive annual TB education appropriate for their work responsibilities and duties.

B. Training should include the epidemiology of TB in the facility.

C. TB education should emphasize concepts of the pathogenesis of and occupational risk for TB.

D. Training should describe work practices that reduce the likelihood of transmitting *M. tuberculosis*.

X. HCW counseling and screening

A. Counsel all HCWs regarding TB disease and TB infection.

B. Counsel all HCWs about the increased risk to immunocompromised persons for developing active TB.

C. Perform PPD skin tests on HCWs at the beginning of their employment, and repeat PPD tests at periodic intervals (at least annually and more frequently if exposure occurs or HCW is in a high risk position).

D. Evaluate symptomatic HCWs for active TB.

XI. Evaluate HCW PPD test conversions and possible nosocomial transmission of *M. tuberculosis*.

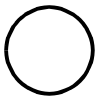
XII. Coordinate efforts with public health department(s).

Interpreting the Results of the Mantoux Test

Palpate the reaction site and measure the induration in millimeters without including erythema. Record the reaction in millimeters of induration. For each of the categories, reactions below the cutting point are considered negative. The following chart is helpful for the determination of a positive or negative result:

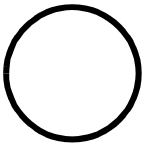
5 or more millimeters induration is considered positive for the highest risk groups, such as:

- ✔ Persons with HIV infection
- ✔ Close contact of a person with infectious TB
- ✔ Persons with chest radiographs consistent with old, healed tuberculosis.
- ✔ IV Drug Users whose HIV status is unknown
- ✔ Foreign born persons from high prevalence areas (Asia, Africa and Latin America)



10 or more millimeters induration is considered positive for other high risk groups, such as:

- ✔ IV Drug Users not infected with HIV
- ✔ Medically underserved populations--high risk racial or ethnic minorities (including blacks, Hispanics, and Native Americans) or locally identified high risk populations
- ✔ Residents of long-term care facilities
- ✔ Persons with medical conditions reported to increase the risk of developing tuberculosis[1]
- ✔ health care workers who provide services to high risk groups



15 or more millimeters induration is considered positive with no risk factors for tuberculosis.

[1]Silicosis, being 10% below ideal body weight, chronic renal failure, diabetes, hematologic disorders such as leukemia and lymphomas, other malignancies or treatment with high dose corticosteroids

Recommendations for Prevention and Control of Scabies in the Long-term Care Facility

Epidemiology

Scabies is a parasitic infestation of the skin caused by the mite *Sarcoptes scabiei* var. *hominus.* The female mite lays eggs in burrows that are several millimeters to a centimeter long in the skin. The larvae emerge as adult mites after 72 to 84 hours and are capable of mating after approximately 17 days. The males die shortly after mating while the female mites continue the life cycle. The infestation appears in the skin as papules, vesicles, or tiny linear burrows which contain mites, their eggs and feces. These burrows are particularly noticeable on the webs between the fingers, on the anterior surfaces of wrists and elbows and under the armpits. In men, burrows may also appear along the belt line, thighs and penis; in women, the area of the nipples, abdomen and the lower part of the buttocks are usually affected. Lesions may also be located in the perineal area and on the back.

The primary complaint is intense itching, particularly at night. Scabies may present atypically in elderly or immunocompromised patients. Loss of sleep and secondary infections associated with scratching can occur. Excoriations are common.

Scabies is transmitted by close personal contact with an infested person. The incubation period in persons without previous exposure is generally 4 to 6 weeks. Persons who were previously infested may develop symptoms 1 to 4 days after exposure. Norwegian scabies or keratotic scabies is easily transmitted because of the high number of mites and the ease with which the crusted lesions allow transfer. Transmission by contaminated clothes and linens may also occur.

The average infestation for conventional scabies is between 10 and 20 live mites per person. In Norwegian scabies or keratotic scabies, an infestation commonly consists of thousands of mites. This type of scabies causes exfoliation of the skin, allowing many mites to be shed onto carpets, clothes, bedding, furniture and carpeting. Norwegian scabies is highly transmissible.

Unfortunately, scabies in the long-term care setting is not uncommon and there are many factors peculiar to long-term care that enhance the risk of secondary cases. Direct patient care is provided by few staff members to many residents. Also, additional contacts may result as infestations may go undetected because the resident may not verbalize his/her symptoms. Thus, diagnosis and treatment frequently occur only after symptoms are observed by a staff person, friend or relative.

In order to prevent additional cases, every effort must be made to monitor, diagnose and promptly treat infested persons and their contacts. A high index of suspicion for scabies

should be maintained by staff in long-term care facilities. Residents or staff members with a generalized dermatitis should be quickly evaluated for this parasitic infection.

Diagnosis

Scabies should be suspected in any patient who itches or has dermatitis. Looking for indications of the burrows caused by scabies in the web spaces between fingers and on the sides of hands and feet may provide evidence of infestation. Good light with appropriate magnification is necessary when evaluating the skin.

The diagnosis of scabies is confirmed by skin scrapings and microscopic identification of live mites, eggs or fecal pellets. An experienced medical professional, usually a physician or nurse, should perform the skin scrapings. A hand held magnifying glass may be used to identify recent burrows.

To obtain a skin scraping, choose a burrow that does not have evidence of scratching. Apply a clear liquid such as mineral oil or water to the lesions or the scalpel blade (#15 round bellied blade) and the glass slides prior to obtaining a specimen. Scrape the skin at a ninety degree angle, removing the superficial skin. Transfer the scraping to a slide. Repeat, scraping a total of six sites and placing them on either the same slide or six separate slides. Place a cover slip over the slide. Methodically examine under low power for mites, eggs and fecal pellets taking as long as five minutes. Slides must be evaluated immediately. They cannot be mailed; the microscope must be available at the facility. Normally one or two mites will be recovered on the slide when a person has conventional scabies. For Norwegian scabies, however, many mites and eggs will be seen on one slide.

When there is question of scabies and the burrows are not easily identified, the ink test may be used. The burrows may be identified by gently applying blue or black ink (from a washable felt tip marker) over the area in question. Ink will be pulled into the burrow marking its presence with a thin ink line when the excess ink is removed by water or alcohol. If a burrow is present, the ink outline will provide an indication of where a skin scraping should be done. The excess ink can be removed by a soapy washing or with alcohol.

Determining the Extent of the Problem

When a patient or staff member has been diagnosed with scabies, it is important that an evaluation be made to determine the extent of the problem within the facility. All patients and staff members should be questioned and thoroughly evaluated for infestation. Make several lists including a list of:

1) **symptomatic persons with confirmed skin scrapings;**
2) **their contacts, differentiating between symptomatic and asymptomatic persons including family members and staff who have provided direct patient care to them;**
3) **symptomatic residents or staff with negative skin scrapings; and**
4) **their contacts.**

Obtain the following information for each individual as applicable: name, room location, age, sex, signs, symptoms and date of onset. Determine if there are any patterns or similarities between cases that may explain the mode of transmission; for instance, all case patients were cared for by a certain staff member or on a certain wing. Use this information to describe the outbreak in terms of time, place and person and determine which treatment protocol should be used.

Therapy and Prevention

Treatment is curative. A lotion or cream of 5% permethrin (treatment of choice) or 1% lindane lotion (gamma benzene hexachloride or Kwell) should be used according to the manufacturer's directions. Lindane may sometimes be irritating. Caution should be used in the treatment choice of persons who are pregnant or those with abraded or scaly skin as it could increase absorption. Nails (which may have mites underneath because of scratching) should be cut before treatment. The lotion or cream should be left on for the time specified by the manufacturer (usually the next day) and then washed off. At that time all linens, bed clothes and clothing should be washed. Itching may not resolve immediately after treatment; however, this should not be taken as a sign of treatment failure. Following manufacturers' or physicians' directions, a second application on symptomatic persons may be needed.

The person(s) responsible for taking control of an outbreak (usually the infection control practitioner) should document the outbreak thoroughly. A detailed plan in writing should be available for others to refer to about their responsibilities for the necessary control measures. The plan should include information about who is responsible for:

1) **providing treatment;**
2) **instructing how/who/where/when to apply the medications;**
3) **applying a second treatment if necessary;**
4) **notifying families and frequent visitors about the problem and the possible need for prophylactic treatment;**
5) **educating the employees on infection control; and**
6) **notifying the local or state health departments of scabies outbreaks.**

There are two treatment protocols—selective treatment or mass treatment—that may be used for treating scabies within a long-term care facility. Depending upon the number of individuals affected within the facility, the treatment protocol decision should be easily made. Regardless of the protocol used, all persons who have had direct contact (staff, relatives, other patients) with a confirmed case or those persons who are symptomatic should be treated prophylactically. Close personal and household contacts of symptomatic employees should also be treated. These treatments should occur on the same day. Otherwise, scabies may be easily reintroduced to the facility.

Selective Treatment: **Generally, selective treatment is used when the following conditions are met: a) the signs and symptoms in the case(s) have been present two weeks or less; and b) there is one symptomatic patient and up to one symptomatic employee (with confirmed skin scrapings of conventional scabies) and no other patients**

or employees show signs or symptoms. The case(s) and symptomatic contacts should receive treatment at the same time.

Mass Treatment: **This protocol should be used for any of the following conditions: a) Norwegian scabies is diagnosed and confirmed in one patient and one employee; b) Norwegian scabies has been confirmed by a skin scraping in one patient and there are two or more additional persons exhibiting symptoms without a positive skin scraping; c) one patient (who has had symptoms for a month or longer) has had scabies diagnosed by a positive skin scraping and many other persons within the facility exhibit signs or symptoms of scabies; or d) two persons within different geographical areas of the facility (residents or staff) have positive skin scrapings within a few days of each other.**

One physician should be designated as responsible for coordination of the outbreak. All other attending physicians should be notified so they are aware of the problem and may give their cooperation. Mass treatment or prophylaxis should be given to all persons including residents, staff, and close personal contacts of all infested persons in the geographical area where the outbreak is occurring. Mass treatment is indicated for Norwegian scabies in all cases.

Other Necessary Information

All treatment of cases, symptomatic persons and contacts should occur on the same day. Confirmed cases should be in a private room or cohorted. Schedule staff consistently with the same patients until the treatment is completed for all persons for whom treatment or prophylaxis is indicated. Contaminated linens should be bagged separately and handled with gloves by persons wearing gowns. Infested employees or residents should be excluded from work or group activities respectively until 24 hours after the initial treatment. Infested persons should be reevaluated one month after treatment was begun to ensure it was successful. Keratolytic agents may be useful following treatment of Norwegian scabies in order to gently loosen and remove the scales. Scabies outbreaks, as well as all other outbreaks, should be reported to the local or state health departments.

References:

Benenson A, ed. ***Control of Communicable Diseases Manual.*** **Washington, DC: The American Public Health Association, 1995; sixteenth edition:415-417.**

Berkow R, ed. ***The Merck Manual.*** **Rahway, New Jersey: Merck Research Laboratories, 1992:2424-2425.**

Braunstein-Wilson B, Weary P. Scabies. In: ***Principles and Practices of Infectious Diseases,*** **1990. Mandell G, Douglas R, Bennet J, eds. New York: Churchill Livingstone, 2165-2166.**

Clark J, Friesen D, Williams W. Management of an outbreak of Norwegian scabies. American Journal of Infection Control, 1992;20:217-220.

Collier C. Guidelines for scabies prevention and control. ***The APIC Infection Control in Long-term Care Facilities Newsletter*****, 1994: Volume 5 Number 2;1-4.**

Crosslley K. Infection control aspects of the employee health program. In: ***Infection Control in Long-term Care Facilities,*** **1994. Smith P, ed. Albany, New York: Delmar Publishing; 198,243.**

Pasternak J, Richtmann R, Ganme A, et. al. Scabies epidemic: price and prejudice. ***Infection Control and Hospital Epidemiology,*** **1994;15:540-542.**

Rasmussen, J. Scabies. ***Pediatrics in Review,*** **1994;15:110-114.**

Foodborne Illness Caused by Microbial Contamination

An outbreak of foodborne illness in a long-term care setting may cause significant morbidity and mortality. The elderly are more susceptible to foodborne illness likely because of advanced age, other underlying diseases or illness, antibiotic usage and nutritional deficiencies. A study entitled "Foodborne Disease Outbreaks in Nursing Homes, 1975 - 1987" found that while nursing home residents accounted for 2.4% of the foodborne illnesses, they accounted for 19.4% of the deaths.[1] Thus, the proper handling of food is extremely important in long-term care settings.

Public health trends typically show an increase in the incidence of foodborne illness during the summer. According to the Centers for Disease Control and Prevention (CDC), bacterial pathogens were responsible for the majority of foodborne diseases and outbreaks reported from 1983 to 1987.[2] Warm weather and an increase in group and outdoor activities where foods are served are factors that increase the summer incidence. Microbial growth in foods is accelerated by holding potentially hazardous foods at improper temperatures (between 45°F and 140°F), about room temperature. Inadequate cooking, poor hygiene of food handlers, using food from unsafe sources and the use of contaminated equipment also contribute to bacterial contamination or growth. Other etiological agents for foodborne illness include viruses and chemical poisonings.

A foodborne outbreak is defined as two or more persons experiencing a similar illness after ingestion of a common food with epidemiologic analysis implicating food as a source of illness.[2-3] In the long-term care setting, primary caregivers (e.g., nursing assistants) are generally the first to notice an increase in symptoms of foodborne illness including diarrhea, temperature, vomiting and stomach ache. Proper documentation of these signs and symptoms for individuals in the long-term care setting and a collective group analysis may provide indication of an outbreak.

If a foodborne outbreak is suspected within a long-term care facility, the local health department should be contacted immediately. In addition, the Utah Department of Health requires reporting of individual enteric diseases such as shigellosis and hepatitis A infection.

Timely reporting to the local or state health department is important. Success of an outbreak investigation is frequently proportional to the amount of time between diagnosis of an illness and the beginning of an investigation. In the case of a foodborne outbreak, one goal of a public health investigation is to confirm the outbreak and determine the etiologic agent as quickly as possible. A health inspection of the facility's food service operation is sometimes warranted. Suspect food samples, if available, are collected for microbial analysis. The primary goal is to develop control measures that can be instituted to prevent further morbidity.

Long-term care facilities should ensure that education is provided to food handlers regarding careful food handling, preparation and storage procedures. Information on food

safety and training materials for safe food handling may be available from local health departments and/or the Bureau of Epidemiology.

References

1. **Williams, R. So Long Sunny Side Up, Preventing Foodborne Illness in Nursing Homes. Reprinted from FDA Consumer Magazine, DHHS Publication No. (FDA) 92-2252.**

2. **CDC. Waterborne Disease Outbreaks, 1986 -1988; Foodborne Disease Outbreaks, 5-Year Summary, 1983-1987. MMWR 1990;39(SS-1):15-23.**

3. **Bean, N and Griffin, P. Foodborne Disease Outbreaks in the United States, 1973-1987: Pathogens, Vehicles and Trends. J of Food Protection 1990; 53:804-817.**

Disease-Causing Organism	Incubation & Duration	Signs and Symptoms	Foods Involved	Prevention Measures
Bacillus cereus	1 - 6 hours- vomiting illness; 6 - 24 hours- diarrheal illness. Generally lasts about 24 hours.	Nausea and vomiting for the short incubation period. Diarrhea and colic for the longer incubation period. Produces two types of toxins.	Commonly found in low levels in dried foods, rice. Organism is from the soil. Also associated with custards, cereals, puddings, meats. Generally associated with cooked foods that have been kept at improper temperatures allowing microbial growth and enterotoxin to form.	Promptly refrigerate cooked foods including rice and vegetables after serving. Follow proper holding temperatures <45°F or >140°F. Reheat leftovers rapidly to 165°F or above.
Campylobacter	3 - 5 days, up to 10 days Generally lasts 2 - 5 days, usually not more than 10 days.	Diarrhea (perhaps with mucus, white blood cells or blood), abdominal pain, malaise, fever, vomiting. May be asymptomatic. Rarely fever and meningitis. Adults may have prolonged illness or relapses.	Organism is found in animals (cattle and poultry). Sources of infection include contact with infected animals, drinking unpasteurized milk and water. Eating foods that have been cross contaminated with poultry. Infected persons may infect animals such as puppies and kittens who then may infect others.	Thoroughly cook all poultry, wash items in contact with raw poultry before reusing, (cross contamination). Use only pasteurized milk and chlorinated water. Wash hands before eating, after animal contact and toilet use.
Clostridium perfringens	6 - 24 hours, usually 10 - 12 hours. Generally lasts 24 hours or less.	Sudden onset of colic followed by diarrhea. Nausea frequently accompanies symptoms, fever and vomiting generally absent. Disease is produced by toxins from the microorganisms.	Generally meats, stews, gravies and meat pies that have been cooked and held, cooled or reheated improperly. Organism is often introduced to food from contaminated soils or the feces from an infected person, then improper temperature allows heat resistant spores to multiply. Associated with outbreaks in facilities with inadequate refrigeration facilities.	Cook foods to the proper temperature (155°F ground beef, 165°F poultry, 130° rare roast beef). Cool hot foods quickly in 4" shallow pans in refrigeration units within 4 hours to <45°F. Hot hold foods at 140°F or above. Heat leftovers to 165°F.
Escherichia coli 0157:H7	12 - 60 hours, 48 hours median. Duration is undefined.	Watery and bloody diarrhea, no fecal leukocytes. Can cause hemolytic uremic syndrome, a rare kidney disorder marked by renal failure, microangiopathic hemolytic anemia, and platelet deficiency.	Unpasteurized milk, undercooked (< 155°F) ground beef and poultry, fruit and fruit products made from dropped fecal-contaminated fruits, unpasteurized juice. Person to person via the fecal-oral route.	Cook ground beef to 155°F. Drink only pasteurized milk and juices. Avoid undercooked raw meat or poultry.
Salmonella	6 - 72 hours, usually about 12 - 36 hours. Variable, carrier state exists.	Sudden onset of headache, abdominal pain, diarrhea, nausea and almost always, fever. Vomiting is sometimes present. May develop into septicemia or focal infection. There are over 2000 serotypes of *Salmonella*.	Uncooked or partially cooked eggs, raw milk and milk products, meat and meat products, poultry. Person to person via the fecal-oral route. The organism is found on pet turtles and fowl. Chronic carriers are rare in humans but common in animals and birds.	Thoroughly cook all poultry to 165°F, pork to 150°F and egg products. Do not pool raw eggs, use a pasteurized product. Do not use raw eggs in eggnog or ice cream. Use only eggs having intact shells.
Staphylococcus aureus	30 minutes to 7 hours, usually 2 - 4 hours. Duration 1 - 2 days.	Violent and abrupt onset with nausea, vomiting, cramps. Sometimes includes diarrhea, sub normal temperature and lowered blood pressure. Very severe symptoms.	Food contaminated with the bacteria (often from openings in the skin) that has been held at improper temperatures allowing the bacteria to multiply and form the enterotoxin. Generally linked to foods that must be handled frequently, deboned chicken, pastries, custards, sliced meats, etc.	Reduce time between preparation and serving. Store potentially hazardous foods at proper temperatures (<45°F or > 140°F). Food workers should have no open wounds or cuts.

References: Benenson, A., ed. *Control of Communicable Diseases in Man,* 15th ed. Washington, D.C.: American Public Health Association, 1990.

Recommendations for Providing Influenza Vaccinations in the Long-term Care Setting

Vaccination should be provided routinely to all residents of chronic-care facilities on an annual basis. The elderly and persons with underlying health problems are at increased risk for complications from influenza including hospitalization and increased mortality. Approximately ninety (90%) percent of the deaths attributed to pneumonia and influenza are in those persons aged sixty-five years and older. Because of the demonstrated protective effect of an influenza vaccination program, Medicare Certified Facilities may bill for the cost of the influenza vaccine and cost of its administration.

The best time to vaccinate residents is between mid-October and mid-November, although vaccinations can be given earlier in epidemic years. Residents admitted during the winter months after the completion of the vaccination program should be vaccinated with the influenza vaccine upon admission. Consent for vaccination should be obtained from the resident or a family member at the time of admission to a facility, and all residents should be vaccinated at one time, immediately preceding influenza season. Generally, vaccination is provided with the concurrence of attending physicians rather than obtaining individual orders for each patient.

Facilities should also provide education and offer employees the influenza vaccine prior to influenza season. This not only protects staff, but also indirectly protects residents who may avoid exposure to staff with influenza.

To decrease the incidence and the complications from influenza, annual vaccination is recommended for the following: 1) All persons aged 65 years or older; 2) Residents of nursing homes and other chronic-care facilities housing patients of any age with chronic medical conditions; 3) Adults and children with chronic disorders of the pulmonary or cardiovascular systems including children with asthma; 4) Adults and children who have required medical follow-up or hospitalization during the preceding year because of chronic metabolic diseases, including diabetes mellitus, anemia, severe asthma, renal dysfunction, cystic fibrosis, hemoglobinopathies, or immunosuppression (including immunosuppression caused by medications); and 5) Children and adults who are receiving long-term aspirin therapy and therefore may be at risk of developing Reye syndrome after an influenza infection.

The following persons should also be vaccinated on an annual basis: 1) Physicians, nurses and other personnel in medical facilities with particular emphasis on vaccination of personnel that care for members of high-risk groups including employees of nursing homes and chronic care facilities; and 2) Individuals who provide care to high-risk persons, such as visiting nurses, volunteers, and household members.

Contraindications to Receiving the Influenza Vaccine

The following persons should not receive the influenza vaccine: 1) persons known to have anaphylactic hypersensitivity to eggs or other components of the influenza vaccine; and 2) adults with acute febrile illness should not be vaccinated until their symptoms have resolved.

Influenza Outbreak Control Measures

While vaccination is the preferable method to prevent outbreaks of influenza, the antiviral drugs, amantadine hydrochloride and rimantadine hydrochloride may be used for influenza prophylaxis during influenza A epidemics/outbreaks or as a treatment for infection with the influenza A virus. When administered to otherwise healthy adults within 48 hours of illness onset, amantadine and rimantidine can reduce the severity and duration of signs and symptoms of influenza by interfering with the replication cycle of the influenza A virus. Prompt response can help to reduce morbidity and mortality due to an influenza A outbreak.

When confirmed or suspected outbreaks of influenza A occur in institutions that house persons of high risk, chemoprophylaxis should be started as soon as possible to reduce the spread of the virus. Rapid antigen-detection testing and viral cultures should be obtained as soon as possible when institutional outbreaks of influenza-like illness are recognized.

When amantidine or rimantidine is used for outbreak control, the drug should be administered to all residents of the institution regardless of whether they received the influenza vaccine in the previous fall. The drug should be continued for at least two weeks or until approximately a week after the end of the outbreak. The dose for each resident should be determined for each resident after consulting the dosage recommendations and precautions in the package insert. To reduce the spread of the virus and to minimize disruption to patient care, chemoprophylaxis should also be offered to unvaccinated staff who provide care to persons at high risk. Prophylaxis should be considered for all staff regardless of vaccination status, if the outbreak is caused by a variant strain of influenza A not controlled for in the vaccine. To reduce the spread of infection and the chances of prophylaxis failure due to transmission of drug-resistant virus, measures should be taken to reduce contact as much as possible between persons on chemoprophylaxis and those taking the drug for treatment.

Resources:

ACIP. Prevention and control of influenza: part I, vaccines— recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 1994;43(RR-9).

ACIP. Prevention and control of influenza: part II, antiviral agents— recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 1994;43(RR-15).

CDC. Update: Influenza Activity— New York and United States, 1994 -1995 Season. *MMWR* 1994;44:132-134.

Recommendations for Providing the Pneumococcal Vaccine in the Long-term Care Setting

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The pneumococcal vaccine is recommended for the following persons:

1. **Immunocompromised adults who are at increased risk of pneumococcal disease or its complications because of chronic illnesses (e.g., cardiovascular disease, diabetes mellitus, alcoholism, cirrhosis or cerebral spinal fluid leaks).**

2. **Persons who are 65 years old or older.**

3. **Immunocompromised adults at increased risk of pneumococcal disease or its complications (e.g., persons with splenic dysfunction or anatomic asplenia, Hodgkin's disease, lymphoma, multiple myeloma, chronic renal failure, nephrotic syndrome, or conditions such as organ transplantation associated with immunosuppression).**

4. **Persons with symptomatic or asymptomatic HIV infection.**

5. **Children aged 2 years old or older with chronic illnesses specifically associated with increased risk of pneumococcal disease or its complications (e.g., anatomic or functional asplenia including sickle cell disease, nephrotic syndrome, or conditions such as organ transplantation associated with immunosuppression).**

6. **Children aged 2 years or older with symptomatic or asymptomatic HIV infection.**

7. **Persons living in special environments or social settings with an identified risk of pneumococcal disease or its complications (e.g., certain Native American populations).**

One dose of pneumococcal vaccine is recommended for healthy adults. However, revaccination should be considered for those persons at risk of fatal pneumococcal infection or those at risk of rapid decline in antibody levels who received pneumococcal vaccine at least six years earlier. This includes those with chronic diseases, especially cardiovascular and pulmonary; patients with splenic dysfunction or anatomic asplenia; Hodgkin's disease; multiple myeloma; diabetes mellitus; HIV infection; cirrhosis; alcoholism; renal failure; nephrotic syndrome; or transplanted organs.

Urinary Tract Infections

Symptomatic urinary tract infections (UTI) and bacteriuria are conditions found frequently in patients residing in long-term care facilities. A study by Garibaldi, et al., found that the prevalence of symptomatic UTI in seven skilled care facilities was 2.6%.[1] Bacteriuria, or the presence of bacteria in the urine, occurs eventually in almost any patient who has an indwelling urinary catheter for more than thirty days.[2] Symptomatic UTIs are caused by the invasion of microorganisms of the genitourinary tract mucosa. Bacteriuria can occur when microorganisms colonize the genitourinary tract. Additional characteristics that are common in the elderly and which increase the risk for developing UTI include recent urinary instrumentation, physical or pathological characteristics that affect urinary tract function, prostatitis, systemic diseases, dehydration or incontinence.[3] Bacteremia in elderly patients, a condition which often leads to increased mortality, is frequently caused by UTI.[4]

One of the greatest risk factors for developing UTI is urinary catheterization. Organisms may enter the bladder in one of three ways: 1) insertion of a catheter through the urethra may carry colonizing organisms; 2) the catheter may provide a direct pathway to the bladder for organisms; and 3) the disruption of the natural urethral defenses between the external catheter surface and urethral mucosa allows entry of organisms through the urethra. Because the presence of an invasive device provides a direct pathway for bacteria to enter the urinary tract, catheters should be used only when medically indicated, not for convenience of staff.

Effective strategies to prevent/reduce the occurrence of UTI include sterile insertion and care of the catheter, prompt removal and the use of a closed collection system. The use of preconnected catheters, disinfectants in collecting bags, silver-ion coated catheters and application of antimicrobial creams have not been proven to consistently reduce the incidence of UTI.[2]

An essential component of an infection control program is to conduct surveillance and to determine various infection rates. When calculating infection rates for UTI, only symptomatic infections that meet specific criteria should be included. Asymptomatic bacteriuria is not included because it is frequently found in the elderly and in most cases, does not require treatment. In general, *only* symptomatic UTI should be treated with antibiotics.[5] Using antibiotics to treat asymptomatic bacteriuria or for prophylactic treatment of newly catheterized persons encourages the emergence of antibiotic resistant organisms. Furthermore, treating these conditions may cause iatrogenic infections, an infection which results from the treatment (i.e., candidiasis), or unnecessary side effects. It must be noted, however, that there are some instances, such as before urologic surgery when antibiotic therapy is necessary.[2]

Urinary tract infections may be nosocomial or community acquired. Unless a patient is admitted with a symptomatic UTI, the UTI should be classified as nosocomial. Each facility should establish and adopt objective definitions for nosocomial infections. According to McGeer, *et. al.*, to meet the criteria for symptomatic UTI, the patient must meet *one* of the following criteria:

1. **The resident does not have an indwelling urinary catheter and has at least three of the following signs and symptoms: (a) fever (≥ 38° C) or chills, (b) new or increased burning pain on urination, frequency or urgency, (c) new flank or suprapubic pain or tenderness, (d) change in character of urine, (e) worsening of mental or functional status (may be new or increased incontinence).**

2. **The resident has an indwelling catheter and has at least two of the following signs or symptoms: (a) fever (≥ 38°C) or chills, (b) new flank or suprapubic pain or tenderness, (c) change in character of the urine,[a] (d) worsening of mental or functional status.[9]**

These criteria are not dependent upon laboratory results because infections are sometimes treated without obtaining the tests or before the laboratory tests have been run. If a urine specimen is *appropriately* collected and processed *and* the symptomatic patient was not taking antibiotics at that time, the culture results should validate the case definition for UTI. However, if a patient meets the criteria for a nosocomial UTI, include the case in the numerator when calculating the UTI infection rate.

Another practical definition for infection for catheterized patients is to look for bacteriuria, and two or more of the following: 1) low abdominal, suprapubic or low back pain; 2) suprapubic tenderness on palpation; 3) an elevated white blood count and 4) fever with no other source of fever or infection.[10]

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[a]Change in character may be clinical (e.g., new blood in urine, foul smell or amount of sediment) or as reported to the laboratory (new pyuria or microscopic hematuria). For laboratory changes, this means that a previous urinalysis must have been negative.

Catheter Care

The onset of bacteriuria and the risk of infection can be somewhat reduced by good technique and proper catheter care. Patient care techniques[6,7] that have been found to reduce or help prevent catheter associated urinary tract infections include the following:

1) **Aseptic technique must be used for insertion of catheters. The smallest size of catheter that allows good drainage should be used. A single packet of sterile lubricant should be used rather than a common tube.**

2) **Avoid trauma and reduce irritation by anchoring the catheter to the inner thigh using tape, a catheter strap or an elastic bandage.**

3) **Keep the system closed. If the system must be opened, the junctions should be disinfected prior to disconnection. Urine samples should be obtained via the collection port, not by disconnection of the catheter/tubing junction.**

4) **Avoid irrigation unless obstruction is anticipated or present, or by physician's order. Irrigation syringes and irrigants must be sterile. Use intermittent rather than continuous irrigation.**

5) **Achieve free flow of urine by keeping the catheter tubing free from kinks. Empty the collection bag on a regular basis using a separate collecting container for each patient. The container and the draining spigot should never come in contact.**

6) **The collection bag should <u>always</u> be kept below the level of the bladder, including when the patient is moving or being transported.**

7) **The perineum should be gently cleansed with a clean washcloth after bowel movements or to remove exudate. It is important to keep the tubing, as well as the urinary opening, free from fecal material. On a regular basis, the perineum should be cleansed with mild soap and water followed by a clear rinse. Other regimens, such as those with povidone-iodine preparations or green soap, may actually encourage the development of UTI and should not be used.[8]**

8) **Discontinue use of the catheter as soon as it is no longer medically indicated. Catheters should not be changed on an arbitrary or routine time interval but when encrusted or obstructed.**

In some instances, a catheterized patient may use a leg bag during the day and a bedside bag at night. Because this requires the frequent opening of the junctions between the

catheter and collection bag, there is an increased risk for contamination of the system. Correct technique and proper disinfection are extremely important as both may decrease the amount of contamination to the closed system.

The University of Utah Hospital Rehabilitation Center has conducted research and developed a procedure for the disinfection of vinyl leg bags/bedside bags. The implementation of this procedure has safely extended the in-hospital wearing time of the catheter bags from one to four weeks in rehabilitation patient population. The decontamination procedure* is as follows:

Decontamination of vinyl urinary drainage bags:

Supplies: **Liquid bleach, (unscented 5.25% sodium hypochlorite)**
Water
Graduated irrigating bottle
Sink, soap, vinyl or latex gloves, toilet, disposable hand towels

Preparation of the Bleach Solution:

1. **Fill irrigating bottle with 150 ml (5 oz) of cold tap water.**
2. **Add 15 ml (.5 oz) of 5.25% sodium hypochlorite (only unscented household bleach).**
3. **Replace bottle cap and invert a few times to mix.**

Procedure:

1. **Wash hands and put on gloves.**
2. **Empty all urine from the bag.**
3. **Fill the bag with 200 ml of cold tap water through the leg bag's connector and extension tubing or down drain's top.**
4. **Agitate water for a minimum of 10 seconds. Empty the water through the spigot into the toilet.**
5. **Repeat steps 3 and 4. Rinsing must be done twice.**

*adapted with permission, University of Utah Hospitals and Clinics, 2/94.

6. **Use the irrigation bottle to squirt 30 ml of the bleach solution onto the drainage spigot, spigot bell, sleeve and cap.**

7. **Squirt the remaining bleach solution into the bag.**

8. **Agitate the solution for 30 seconds ensuring that the solution touches all interior surfaces. The 30 seconds must be timed using a clock or watch.**

9. **Drain the solution into the toilet and flush.**

10. **Allow the bag to air dry until the next use leaving the top of the bag uncapped and the drainage spigot open. The open spigot will serve as a sign that the decontamination procedure has been done.**

11. **Remove the gloves. Wash your hands.**

Precautions to using bleach:

1. **Do not touch bleach or solution to metal surfaces on bathroom fixtures, clothes or skin.**

2. **Do not mix bleach with soap or other cleaners because it may create harmful vapors.**

3. **Do not prepare bleach solution in advance because chlorine dissipates with time or light exposure.**

4. **Assure complete removal of bleach solution from the bag and tubing after decontamination to prevent reflux of solution into the external catheter, onto patient's skin, etc.**

Additional Recommendations for UTI Prevention:

There are many additional patient care practices that help to prevent the development of UTI in residents of long-term care facilities. Encouraging and offering liquids helps to keep residents well

When implementing any new type of protocol or procedure for patient-care that could increase patient risks for infection, it is important to monitor whether the change has adversely affected infection rates. If there is an increase in infection rates, further investigation should be conducted to determine why. It may be that the procedure is not working well or that the protocol is not being followed. However, it may be that the new protocol or procedure increases infection risks and should be discontinued. Monitoring the results of changes by collecting the appropriate data is the only way to measure the results of infection control efforts.

hydrated. Catheterized patients that are able to comprehend and personnel taking care of patients with catheters should be carefully instructed on catheter care, the importance of good handwashing and the avoidance of reflux and cross-contamination.

Continually reinforce good patient care practices and proper technique to personnel through inservices and health promotion materials. Remind staff that they play an important role in infection prevention. Handwashing, with soap and warm water, before and after assisting a resident with toileting or catheter manipulation, remains a most effective measure. Standard Precautions (a combination of Body Substance and Universal Precautions) indicate that gloves should be worn if contact may occur with a moist body substance, mucous membrane or non-intact skin. These precautions should be followed at all times with all patients. Proper care of the perineum, particularly for those patients with fecal incontinence, is extremely important. Many UTI are caused by bacterium that are endogenous to the gastrointestinal tract. Teach personnel to avoid cross-contamination between different body sites by cleaning fecal material away from the urinary meatus (e.g., wiping from front to back). Many outbreaks of UTI have been caused by inadequate handwashing by personnel or sharing of personal items between patients.

Ideally, patients with urinary catheters should not share rooms with patients who have predisposing conditions for infection such as invasive devices, including other patients with urinary catheters. However, in the long-term care setting, this may be impractical. Additionally, a patient with an invasive device such as a urinary catheter should not room with a patient who has a weeping or draining infection or an infection caused by a drug-resistant organism, such as methicillin resistant *Staphylococcus aureus* (MRSA).

Although there are many methods to prevent UTI in patients of long-term care facilities, these infections are not always preventable. Through early detection of infection and promptly providing the proper treatment, outcomes for those developing UTI may be improved.

Resources:

1 Garibaldi RA, Brodine S, Matsumiya S. ***Infections among patients in nursing homes, policies, prevalence and problems.*** **New Engl J of Med 1981;305:731-735.**

2 Stamm W and Hooton T. ***Management of Urinary Tract Infections in Adults.*** **New Engl J of Med 1993;329:1328-1334.**

3 Smith, P. ***Infection Control in Long-term Care Facilities*** **(New York: John Wiley and Sons, Inc., 1984), 107-123.**

4 Krieger J, Kaiser D, Wenzel R. ***Urinary tract etiology of bloodstream infections in hospitalized patients.*** **J of Infectious Diseases 1983;148:57-62.**

5 Nicolle LE. ***Urinary tract infections in long-term care facilities.*** **Infect Control Hosp Epidemiology 1993;14:220-225.**

6 The Centers for Disease Control and Prevention. ***Guideline for Prevention of Catheter-Associated Urinary Tract Infections and Guideline Ranking Scheme,*** **Infect Control 1981, 2:1-9.**

7 The Association for Practitioners in Infection Control, ***The APIC Curriculum for Infection Control Practice, Volume III*****. (Dubuque: Kendall Hunt Publishing Co., 1988), 1341-1343.**

8 Burke J, Garibaldi R, Britt M, et al. ***Prevention of catheter-associated infections, efficacy of daily meatal care regimens,*** **2nd International Conference on Nosocomial Infections, Atlanta, GA. August 1980.**

9 McGeer A, Camplebell B, Emori TG, et. al, ***Definitions for infection surveillance in long-term care facilities,*** **Am J of Infection Control 1991;19:1-7.**

10 Reimer L. ***Urinary tract infections in catheterized patients,*** **Nosocomial News 1994;14:40.**